IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Attorney Docket No. 016906/0183

In re Application of
Oliver Beck *et al*
Serial No: 09/121,702
Filed: July 24, 1998
For: Heating or Air-conditioning System for a Motor Vehicle

Group Art Unit: 3743
Examiner: J. Ford

CORRECTED BRIEF ON APPEAL

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

This Appeal Brief is being filed in triplicate together with a check in the amount of $310.00 covering the appeal fee. Appellants hereby appeal to the Board of Patent Appeals and Interferences the decision of the Final Rejection dated **April 11, 2001,** rejecting claims 1, 4-7, 9 and 11-14.

REAL PARTY IN INTEREST

The real party in interest is Behr GmbH & Co. An assignment has been recorded with the Patent & Trademark Office.

RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeal or interference.

STATUS OF CLAIMS

Claims 1, 4-7, 9, 11-14 and 15-17 are pending. Claims 15-17 have been withdrawn from consideration. A copy of the claims on appeal is presented in the APPENDIX.

Claims 1, 4-7, 9, and 11-14 stand rejected under 35 U.S.C. § 103 as being obvious over the prior art, based on several grounds of rejection. In addition, claims 1, 4-7, 9, 11, 13 and 14 also stand rejected under 35 U.S.C. § 112, first paragraph, as lacking written description support in the application as originally filed. No claim has been allowed.

The Advisory Action dated August 22, 2001, does not indicate that any of these grounds of rejection have been overcome.

STATUS OF AMENDMENTS

No amendments were made in the Response filed on August 13, 2001, in reply to the final Office Action. The Advisory Action indicates that the Declaration under 37 CFR § 1.132 of Hans Kampf has been considered and therefore is presumably entered.

SUMMARY OF INVENTION

The claimed invention is directed to a heating or air-conditioning system for a motor vehicle. In particular, the system is designed to independently control both the temperature and volume of air supplied to four separate zones in the passenger compartment of a motor vehicle, typically, a front driver's side, a front passenger's side as well as a rear right and rear left passengers' side. The claimed invention is advantageous because it provides a high level of independent control (both temperature and volume of air) while at the same time being extremely compact, which is an extremely important issue in modern car design. Providing four independently controlled zones and compactness are countervailing design issues, i.e., to provide four mixing chambers in the same space as two means that each of the four chambers must be half as large, thereby making it more difficult to achieve uniform mixing of warm and cold air. In its most preferred embodiment, the claimed invention also overcomes another recognized problem in the automotive heating and air-

conditioning field, namely, the problem of non-uniform temperature profiles exiting from the heater/air conditioner vents in the vehicle passenger compartment. The record contains evidence attesting to these problems that are solved by the claimed invention.

With reference to Figures 1 and 2, the heating or air-conditioning system 10 has an evaporator 14, arranged in a housing 12, for producing cold air 16. Arranged downstream of the evaporator 14 is a heater 18 for producing warm air 20. As can be seen in Figure 2, cold-air ducts 26 and 28, which can be closed off via cold-air flaps 30 and 32, are provided to the sides of the heater 18. Following in the direction of flow, warm-air control elements 36, 38, 40 (and 42 not shown) are provided directly at the outlet side 34 of the heater 18. Each warm-air control element has a plurality of lamellae 44 which are arranged in the manner of a blind and, in order to form one of the warm-air control elements, can be pivoted together in parallel via a coupling. In their closed position, the lamellae 44 of a warm-air control element 36, 38 or 40 (and 42) cover an associated sub-region of the outlet side 34 of the heater 18.

An air-mixing space 45 follows the warm-air control elements 36 to 42, as seen in the direction of flow, and the warm air 20 heated in the heater 18 and the cold air 16 routed past the heater 18 in the cold-air duct 26 or 28 enters into the air-mixing space and is mixed therein, for the purpose of obtaining air at a desired temperature. The air-mixing space 45 is divided by a plurality of partition walls 46 and 48, into four individual mixing spaces 50, 52, 54 and 56. Each of the mixing spaces 50 to 56 is assigned one of the warm-air control elements 36 to 40 (and a fourth warm-air control element 42, not shown, that corresponds to space 56), and one of the four cold-air ducts opens out into each of the mixing spaces 50 to 56. The cold-air ducts 26 and 28 are thus each divided into two cold-air sub-ducts along the section line II-II, it being possible for each of the cold-air sub-ducts to be closed off by one of the cold-air flaps 30 or 32. All the flaps, that is to say the four warm-air control elements and the four cold-air flaps, can be activated separately via a control unit. This means that the air temperature in each mixing space can be adjusted separately, with the result that different temperature-controlled air can be fed to four air-conditioning zones. Since the warm-air control elements "cover" the corresponding sub-region of heater 18 when closed, the cold-air flaps can "close off" the associated cold-air sub-ducts and each of the eight control elements can be separately activated, the claimed system can independently control both the temperature and volume of air supplied to each of the four air-conditioning zones of the vehicle.

ISSUES

The issues in this appeal correspond to the following grounds of rejection that are set forth in the final Office Action:

(1) the rejection of pending claims 1 and 7 under Section 103(a) over JP 58-136813 (hereinafter JP '813) in view of Inoue (U.S. 5,775,407) or newly applied JP 58-122213 (hereinafter "the JP '213 reference");

(2) the rejection of claims 1 and 7 under Section 103(a) over the prior art in (1) above, further in view of German 35 14 359 (hereinafter "DE '359") or German 39 40 361 (hereinafter "DE '361");

(3) the rejection of claims 1 and 7 under Section 103(a) over DE '359 in view of JP '813;

(4) the rejection of claims 4-6 and 12-14 under Section 103(a) over "the prior art applied to claim 1" and further in view of Otsuka (U.S. 3,881,546) and Logsdon (U.S. 3,967,779);

(5) the rejection of claim 5 under Section 103(a) over "the prior art as applied to claim 1" and further in view of Sugawara et al. ("Sugawara") or Moore;

(6) the rejection of claims 7, 9 and 11 under Section 103(a) over the "prior art as applied to claim 1" and further in view of Sarbach; and

(7) the rejection of claims 1, 4-7, 9, 11, 13 and 14 under 35 U.S.C. § 112, first paragraph, as being based on a disclosure that allegedly lacks a written description of the recitation in the claims that the quantity of air fed to each of the four heating/air-conditioning zone is independently controllable.

GROUPING OF CLAIMS

Claims 1, 7, 9 and 11 can be considered together.

Claims 4, 5, 6, 12, 13 and 14 each present separate issues of patentability.

SUMMARY OF THE ARGUMENT

There is a threshold issue in this case that should be dispositive of the Section 103 issues. The prior art rejections set forth in the Final Rejection are based on an incorrect application of the law, in that the PTO has impermissibly ignored some of the words in Appellants' claims. The law requires that all words, even those alleged to be unsupported by the specification, must be considered in making a determination under Section 103. See, M.P.E.P. § 2143.03. Thus, the Final Rejection is essentially based on only part of Appellants' invention. Nowhere does the Final Rejection establish or even suggest that the claimed invention, including the allegedly unsupported features, would have been obvious over the prior art. This error was noted in Appellants' response to the Final Rejection but was not addressed in the Advisory Action. Since the prior art rejections clearly contravene the applicable law and practice, they should be reversed on this basis alone.

The prior art references do not teach the person of ordinary skill in the art to modify the known structures in order to arrive at the claimed structure having the claimed operating characteristics and important advantages, i.e., permitting the independent control of both the temperature and volume of conditioned air to each of four separate passenger compartment zones in a very compact arrangement. Nor does the prior art, either individually or collectively, suggest the advantages achieved by the claimed, very compact system having these beneficial operating characteristics, or the solution according to the claimed preferred embodiments of the problem of non-uniform temperatures in the air streams exiting from the heating/air-conditioning vents. These advantages, supported by evidence of record, establish a strong objective showing that the invention would not have been obvious at the time it was made.

Appellants have submitted detailed arguments and Declaration evidence demonstrating that the claimed subject matter is described in the application as originally filed. Because the disclosed embodiment is described as having structure and functionality that operates in the manner recited in the claims, the claim language reciting this mode of operation cannot constitute language unsupported by a proper written description. Thus, the Section 112 rejection is clearly improper.

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ARGUMENT

I. Background

Appellants do not purport to be the first to invent a four-zone heating or air-conditioning system for a motor vehicle that is capable of independently controlling both the temperature and volume of air in each zone. They only claim to have invented a new and better system, i.e., better in terms of compactness and in terms of efficiency of operation. On pages 1 and 2 of the present specification, Appellants describe two different prior art four-zone systems that provide for independent control of air temperature and volume in each of the four zones, the second of those systems dating back to 1989. Both of these systems suffer from disadvantages that are overcome by the present invention.

The field of the present invention is a very crowded and a very competitive one; the basic elements of these systems have been around for decades. Improvements in this field are actively sought after, but come in small increments, typically in the form of novel and improved rearrangements and configurations of the basic system elements. Appellants' assignee, Behr GmbH & Co. is a major competitor that is deeply immersed in this field, supplying heating/air-conditioning systems to major auto-makers such as Mercedes, Porsche and BMW. One of the key prior art references (DE '359) is assigned to Behr and stems from the mid-1980's.

It is Appellants' position that (1) four-zone heating/air-conditioning systems capable of independent control of the temperature and volume of air to each zone (and their desirability) have been known since at least the late 1980's; (2) the motivation for the industry to provide compact, four-zone systems has been present since at least the early 1980's, when vehicle downsizing became significant due to energy concerns; (3) the principal prior art references upon which the present rejections are based stem from the early to mid-1980's; (4) therefore the facts and circumstances contradict the PTO's allegation that the claimed invention would have been obvious, to a person of ordinary skill in the art in 1997, and rather demonstrate the opposite, since all of the individual pieces and the problems to be solved were available for many years prior to the present invention in a highly competitive field; and (5) the clearly very advantageous improvements in compactness and operation manifested by the present invention, as shown by evidence of record, further

demonstrate the non-obviousness of the claimed invention.

As noted above, the PTO has only examined a portion of Appellants' claimed invention, i.e., the PTO has ignored the stated feature that the volume of air to each of the four zones can be independently controlled. Consequently, Appellants do not know what the PTO position is with regard to the patentability of the whole claimed invention. What is clear from the record, however, is that the PTO has taken the position that the circumstantial evidence in support of patentability, as outlined above, and the Declaration evidence submitted by Appellants in support of patentability was not found to be convincing to the PTO, for the stated reason that the PTO postulates that the level of motivation did not rise to the appropriate level (in its view) until the mid-to-late-1990's to arrive at the advantageous four-zone system claimed.

First, this is not the correct standard of patentability. Second, Appellants believe that the PTO's mere pre-supposition of the state of the prior art in this respect is belied by numerous facts of record, and most visibly by the fact that the principal vehicle downsizing took place in the 1980's and by the additional fact that BMW already described in DE OS 39 40 361, filed in 1989, a four-zone heating/air-conditioning system capable of providing independent control of both the temperature and volume of air supplied to each of the four zones. These facts and other evidence of record clearly demonstrate that the industry was seeking such advantageous systems and had strong motivation (in fact, was forced) to achieve compactness many years before the present invention was made, yet failed to arrive at the claimed invention and its advantages. In a real world sense, these facts are the strongest possible evidence of non-obviousness.

II. The Rejections Based on the Prior Art are Legally Flawed Because the PTO Failed to Consider All Words of the Claims

In the Final Office Action, the PTO has taken the position that "claimed subject matter not supported by the specification as originally filed" and arguments based thereon "are of no moment." (Page 4) This represents an incorrect procedure for determining the patentability under Section 103. According to the law, every word in a claim must be considered when making the determination under Section 103, including language in the claim that the PTO separately concludes is not supported by the specification. See, for example, *Ex parte Pearson*, 230 U.S.P.Q. 711 (Bd. App. 1986), citing the applicable

precedent. See also, M.P.E.P. § 2143.03, which is directly on point.

Consequently, the PTO has not properly evaluated the patentability of claims 1, 4-7, 9, 11 and 13-14, all of which recite the language that was improperly ignored in reaching the stated conclusion of obviousness. Moreover, the PTO has not set forth any alternative basis for the rejection of those claims that takes into consideration the improperly ignored language, i.e., the PTO has not stated that the claimed subject matter, including the recitations for which written description support is allegedly absent, would have been rendered obvious by the prior art cited in the Final Office Action. (As discussed in detail below, a compact system embodying the claimed feature of independent control of air temperature and air volume in each zone is not taught in any of the prior art references relied upon in the Final Rejection.) Based alone on the fact that the Final Rejection is grounded on an erroneous legal consideration of the claimed subject matter, the stated grounds of rejection as to these claims should be reversed.

Although this fundamental legal error in the rejections was explained in Appellants' response to the Final Rejection, unfortunately the Advisory Action does not inform Appellants of the PTO's position with regard to these issues. However, since the case law and the MPEP are explicit as to this point, it is not believed that this error is open to serious argument. Therefore, the only issue that should remain with respect to all of the claims on appeal (save claim 12) is the sufficiency of disclosure rejection under § 112. This issue is discussed next.

III. The Written Description Rejection is Improper Because the Disclosed Embodiment Is Described as Operating in a Manner that Necessarily Provides Independent Air Volume Control

The rejection of claims 1, 4-7, 9, 11, 13 and 14 under 35 U.S.C. § 112, first paragraph, is grounded on the PTO's allegation that those claims are based on a disclosure that allegedly lacks a written description of the recitation in the claims that the quantity of air fed to each of the four heating/air-conditioning zones is independently controllable.

Appellants respectfully submit that the PTO is factually incorrect in its allegation that the originally filed application does not contain a "written description" of the claimed feature that the quantity of air fed to each of the four heating/air-conditioning zones is independently controllable. While this precise language is not used in the specification, this is not the test

for written description. The entire written disclosure as well as the patent drawings must be considered to determine what is contained in the written description of the invention. The applicable legal standard is what a person of ordinary skill in the art would have understood from the totality of the original application disclosure. In this instance, the skilled artisan would have understood from Appellants' specification and drawings that the disclosed preferred embodiment operates to independently control the volume and/or quantity of air that is fed to each of the four independent zones, as will be explained below.

Of record is a Declaration under Rule 132 by Hans Kampf, a person of ordinary skill in the heating/air-conditioning design art. He has worked for Appellants' assignee in this capacity since 1981. In paragraph 3 of his Declaration, Mr. Kampf outlines in detail the portions of the original disclosure of the present application that provide a written description of the claimed feature that the quantity of air fed to each of the four heating/air-conditioning zones is independently controllable, i.e.:

> For example, the disclosure on pages 4-6 of the original application describes the preferred embodiment in detail. Beginning on line 15 of page 4, it states that "each of the four cold-air ducts then obtained opens out in each case into one mixing space (50, 52, 54, 56)." Beginning at line 32 of that page, it is stated that, if "each mixing space is assigned at least two of the air-stream control elements, of which one is provided as a cold-air flap in the cold-air duct and a second is designed as a warm-air control element arranged directly on the outlet side of the heater, it is possible for the cold-air stream and the warm-air stream to be regulated separately from one another." At lines 18-19 of page 5 it is also noted that "each mixing space can also be fed cold air in a separately adjustable manner." The following disclosure through page 6 makes it clear that the cold air ducts can be "closed off" (page 6, line 22) with air flaps 30 and 32, and also that the warm-air control elements, i.e., lamellae 44, in their closed position, "cover" (page 6, line 29) one of the respective sub-regions of the heater 18.

completed quote

this permits the optimal temperature regulation of the air in the respective mixing space

In order that

each of the two cold-air ducts is divided in two

Mr. Kampf concludes as follows at the end of paragraph 3 of his Declaration:

> With these two types of control for the quantity of cold air and heated air, that allow the air to flow or to be shut off, a person skilled in the art understands that the volume of air fed into each of the four zones can be controlled independently of the volume of air supplied to each the other zones. This feature is disclosed in the subject application, as it would be understood by a person of ordinary skill in the art, and as will be discussed below, represents an important and advantageous feature of the invention described in the application.

Although not specifically cited in Mr. Kampf's Declaration, Appellants further note the disclosure at page 6, lines 12-14 of the original application that "[a]ll the flaps, that is to

say the four warm-air control elements and the four cold-air flaps, can be activated separately via a control unit, with the result that different temperature-controlled air can be fed to four air-conditioning zones." Thus, the original disclosure is unambiguous that each of the eight control elements can be activated separately and that each is capable of closing off or covering its respective flow channel. This structure and mode of operation permits the volume of air fed to each of the four mixing chambers, and therefore the volume of air exiting each mixing chamber, to be independently controlled.

Since this is, in fact, the manner in which Appellants' described preferred embodiment has been described as operating, it cannot be "new matter" to recite this manner of operation in the claims. There can be no doubt that the Appellants were in possession of this aspect of their invention as of the filing date of this application, since this aspect represents the very mode of operation of the preferred embodiment that is described in detail in the specification and drawings. For these reasons, it is respectfully urged that the stated rejection under Section 112 is improper and ought to be reversed.

In the Advisory Action, the PTO states that the Kampf Declaration "has misquoted the relevant sections of the specification." By "misquoting" the PTO means, as explained in the Advisory Action, that some portions of various sentences were not included, and it is alleged that the omitted portions "work against" Appellants' arguments. Appellants respectfully submit that nothing has been "misquoted," that all quotes are meant to be read in the context of the specification, that all quotes stand for and fully support precisely the points for which they were quoted, and that none of the omitted language in any way "works against" the points for which the quotes were presented. While it can certainly be seen from the entirety of the language contained in the specification before the PTO, the omitted portions of quoted language state that the described operation provides for independent control of the air temperature, rather than the air volume; however, it is not seen how this fact in any way detracts from the understanding of the skilled person that the structure and operation of the disclosed device also provides for the independent control of the air volume, which is the issue at hand and precisely the point that Mr. Kampf makes in his conclusion. These criticisms of Mr. Kampf's Declaration are therefore believed to be unfair and to miss the point regarding the issue under consideration, i.e., what the person of ordinary skill in the art would understand to be described in the original specification.

IV. The Prior Art Rejections Are Improperly Grounded Both Legally and Factually

A. Background

Appellants believe that the PTO has based its prior art rejections of the pending claims on (1) an incorrect factual premise as well as on (2) an incorrect application of the law.

The Incorrect Factual Premise

The Office Action evidences the fact that the rejections are based on a factual premise arrived at by the PTO, namely,

> "It is submitted that what has changed in the automotive art in the last two decades is the size of automobiles. The average size car in 1998 is much smaller than the average size car in 1988. This has forced car makers to reduce the size of components. Smaller sizes are driving the automotive industry and its suppliers to look for smaller solutions to problems. In the luxury car market . . . where relatively expensive four-zone heating and cooling systems are, no doubt, to be first deployed, the need for compact packaging of the air-conditioner/heater was much greater at the time that this application was filed than in the past. It is respectfully submitted that the age of the references and the obviousness or non-obviousness of their combination must be judged at the time the current invention was made not in a purely historical context." (underlining supplied)

This factual premise is believed to be incorrect and, as such, cannot be employed to support the stated rejections. As set forth in the Declaration of Hans Kampf, the most significant downsizing of automobiles took place in the 1970's and the early 1980's, and the motivation for arriving at a compact four-zone heating/air-conditioning system was equally as strong in the mid-1980's, when the cited prior art references were published, as it was in 1997, when the priority application of the present application was filed. (Paragraphs 5 and 6) Indeed, the idea of a four-zone system with independent control of temperature and air volume in each of the zones is not new; however, in spite of prior four-zone systems providing independent control of both air temperature and volume (e.g., DE '361), and in spite of essentially unchanged space considerations over the past 15-20 years, the industry has not implemented a compact and practical four-zone system capable of the desired independent control.

The PTO is also incorrect if it is implying that the "historical context" (i.e., the "real

world" context) is not relevant to the consideration of patentability under Section 103. The long-felt need for a particular solution, coupled with a failure of those in the art to satisfy that need, has consistently been recognized by the courts as constituting strong evidence of patentable invention. This is one of the so-called secondary factors expressly mentioned by the Supreme Court in the landmark *Graham vs. John Deere* case. The automotive heating/air-conditioning field is crowded and is characterized by improvements that are not made as bold leaps forward, but rather as relatively modest refinements in basic design. In those instances, such as the present invention, where those relatively modest changes in design result in demonstrative advantages in the practical marketplace, such innovations deserve to be recognized as patentable inventions.

In the Advisory Action, the PTO suggests that the Kampf Declaration is further deficient because it does not "address market conditions at the time the invention was made." In other words, it is apparently suggested that the degree of financial motivation present in the marketplace is somehow a factor that is relevant to patentability, i.e., the financial incentive to make the subject invention. Appellants believe that there is no legal precedent to support this "theory" of patentability.

The Incorrect Legal Standard

The PTO has applied an incorrect legal standard in several respects. As discussed above, the PTO has not properly evaluated the patentability of claims 1, 4-7, 9, 11 and 13-14, all of which recite the language that was improperly ignored in reaching the stated conclusion of obviousness. Thus, the PTO has not applied any rejection to the complete subject matter of those claims. As a threshold matter, therefore, all rejections of these claims should be reversed as being based on an incorrect legal standard.

In addition, even if the PTO's stated factual premise were accepted *arguendo* as being correct, it would not constitute a proper legal basis for supporting an allegation of obviousness. If one analyzes the line of thinking of the PTO in support of the stated rejections, it is that the claimed subject matter is rendered obvious, not because the prior art or level of skill in the art has changed or because the problems to be solved have changed, but rather because the demand in the marketplace has allegedly increased, so that there is more motivation or financial incentive to "make" the invention. Appellants are not aware of any decided precedent in the case law that would support this line of argumentation. If the PTO

cannot find such precedent, this line of argument should be withdrawn. The body of case law that has developed to interpret § 103 focuses on the level of skill in the art, and in the present case there is no evidence that the level of skill in the art was changed between 1986 and the date on which the present invention was made.

Moreover, the PTO's line of argumentation does not withstand logical scrutiny. It is based on the incorrect premise that automobile air-conditioning designers have designed four-zone heating/AC systems in the past (since at least 1986) as either less-functional and/or as big clunky systems, when it was actually within their level of skill to design systems that were more compact and more functional. Of course, this premise obviously does not reflect reality. Designers clearly did not have the latitude to be unconcerned regarding space considerations, and it is evident that the added functionality and advantages of the present invention are both significant and not the result of a significantly more expensive design.

Appellants do not wish to elevate this point to be a main argument in support of patentability, inasmuch as the teachings of the prior art are, most of all, technologically deficient. As the record stands, none of the systems disclosed in the prior art references cited in the foregoing rejections accomplishes both of the main advantages of the present invention, i.e., compact design and having independent control of both temperature and volume of air supplied to the four zones. In addition, as to the preferred embodiments claimed in claims 4, 5, 6 and 12-14, the prior art underlying the rejections does not teach the claimed solution for the problem of air streams having non-uniform temperature profiles. Thus, there are far more important factual deficiencies in the stated rejections than the issue of whether there was "more motivation" in 1997 than in 1989.

B. Claims 1, 7, 9 and 11

The rejection of claims 1 and 7 under Section 103(a) over JP 58-136813 (hereinafter JP '813) in view of Inoue (U.S. Patent 5,775,407) or JP 58-122213 (hereinafter "Egawa") or further in view of German 35 14 359 (hereinafter "DE '359") or German 39 40 361 (hereinafter "DE '361")

Neither the primary JP '813 reference nor the secondary references to Inoue or Egawa disclose systems having four air-mixing chambers, but rather only two mixing chambers. The PTO's simplistic view is that it would have been obvious to split the JP '813 system with a vertical partition, to replicate the front-rear two-zone system of JP '813 on either side of such a partition. First, the state of the art in this field belies the premise that developing such a complex system is as simple as that. For example, putting four (4) separate mixing chambers in the space formerly occupied by two (to maintain compactness) means that each of the four chambers must be half the size of those in the prior art two-zone system. This fundamentally changes the air-flow and air-mixing characteristics. See Paragraph 8 of the Kampf Declaration regarding these "mutually contradictory considerations." More importantly, the postulated combination of JP '813 with either Inoue or Egawa leaves completely unaddressed the question of independent control of the volume of air to each of the four zones. A person skilled in the art would not necessarily have been motivated to design the purportedly "obvious" system to have independent four-zone control, especially since other prior art that does relate to four zones, e.g., DE '359, is designed such that flaps 5 and 6 control the volume of air to more than one zone, thereby not providing independent control in four zones.

This tertiary reference, DE '359, does disclose four air-mixing chambers, but is incapable of providing independent control of both the quantity and temperature of four separate zones. Because the air flaps 5 and 6 are in a common space supplying at least two mixing chambers, the volume of air (at least at the same temperature) cannot be independently controlled for the four mixing chambers in the system disclosed in Figs. 4-6. Of course, the basic design of the system in DE '359 (employing two heaters and having a central cold air path) is substantially different from the presently claimed invention, as well

as offering none of the advantages. The PTO does not dispute these differences.

Appellants do not have an English translation of the DE '359 reference; however, it is not believed that a description of this document is needed beyond the observations noted above. The PTO seems to be approaching this document from the standpoint of requiring Appellants to explain the reasons why a person skilled in the art would not have modified the reference to introduce features of the present invention. This is not the correct standard of patentability. A well recognized tenet of patent law is that it is not a question of whether the reference could be modified, but rather whether there is any reason, evident from the prior art, to suggest such a modification. The system of DE '359 is designed differently from the present invention, as explained above, and it is not designed to provide independent control of the volume of air to the four individual air mixing chambers and/or zones. Furthermore, it does not employ louvers as part of its design.

One of the inventors of the DE '359 reference, Hans Kampf, has stated in his accompanying Declaration under Rule 132 that the invention set forth in the present application claims was not obvious to himself and sets forth his opinion that it would not have been obvious to other persons skilled in the art in spite of the existence of his own prior art DE '359 reference in the public domain from 1986 until the priority application of the instant case was filed in 1997. The other principal reference in this case, JP '813, was published in 1983. The Declaration is clearly representative of objective evidence that the presently claimed invention was not, in fact, obvious to persons of ordinary skill in the art at the time that it was made.

As already pointed out above, the further combination of DE '359 with the other references of the basic combination actually undercuts the basic combination (because independent four-zone control is absent) rather than aid it, contrary to the alternative ground of rejection set forth in the Office Action. Even more so, DE '361 (the other tertiary reference) suggests a completely different approach to a four-zone system, i.e., one in which a warm air duct and a cold air duct are piped to each separate zone and in which a separate air mixing chamber is provided at the outlets of those pairs of ducts, i.e., the antithesis of a compact system. These references to different kinds of less advantageous prior art four-zone systems present nothing more than an invitation to invent a better four-zone system. They evidence the non-obviousness of the present invention, not the contrary.

In view of the fact that not one single prior art reference cited in support of these rejections actually addresses the issue of independent control of both the temperature and

volume of conditioned air in a compact four-zone system (and only DE '361 actually provides such a system in a fundamentally different and bulky configuration), it is submitted that the cited prior art cannot possibly render "obvious" the claimed invention that provides this advantageous mode of operation in a highly compact system. Appellants note that the PTO has actually not alleged that this art renders such an invention obvious, but rather has simply (and improperly) ignored the claimed feature requiring this mode of operation. A proper consideration of all of the claim language must necessarily reach the conclusion that the claimed subject matter cannot be rendered "obvious" by prior art that is silent with respect one of the important claimed features of the invention.

The rejection of claims 1 and 7 under Section 103(a) over DE '359 in view of JP '813

The third alternative ground of rejection of claim 1 is based on a combination of DE '359 and JP '813, both already discussed above. It is apparently the position of the PTO that it would have been obvious to modify the four-zone system of DE '359 with either of the arrangements taught in Figure 2 or 3 of JP '813. However, it is evident from the "Modified Figures" included in the Final Office Action that the resultant modifications are merely another way to attempt to arrive at the structure of the present invention, based on the logically unsound and unmotivated combinations of two references (discussed above in connection with the other grounds of rejection) that do not disclose or suggest a key claimed feature of the invention, i.e., based on the beforehand knowledge of Appellants' invention.

It is apparent from the Modified Figures that the modifications have virtually nothing left of the DE '359 reference, save for the idea of four zones. It is meaningless to think of "modifying" a reference system by essentially gutting the entire design and mode of operation and replacing it with the innards of another system. This is not how the real world innovates, and it is not an appropriate way of determining the issue of obviousness. Moreover, it is not taught and would not be equivalent to substitute (1) a single heater for the two spaced heaters or (2) **separate** control flaps or louvers for the **common** flaps 5 and 6 in DE '359, since this would change the fundamental design and operation mode of the DE '359 system, i.e., this would provide for independent control of the volume of air which is not a feature of DE '359. Moreover, as noted above in connection with the rejection based on JP '813 as the primary reference, fundamentally changing the innards of any system will also

fundamentally change the air-flow and air-mixing characteristics of the system. The PTO's "modifications" are clearly more inventive than the prior art evidence produced by those skilled artisans who were actively engaged in this very competitive field between 1986 and 1997.

Appellants once again note that the PTO's logic underlying the foregoing rejections (that it would have been a simple matter to modify the prior art to arrive at the claimed invention) is contradicted by the factual evidence, i.e., that in spite of the long-known prior art and a strong motivation to produce a compact heating/AC system capable of the enhanced mode of operation delivering independent control of both the temperature and volume of conditioned air in four separate passenger compartment zones, the industry in this fiercely competitive field had simply failed to come up with such a desirable system for more than 10 years after the appearance of the key cited prior art references. The real world facts compel the objective conclusion that the claimed invention was not, in fact, and therefore would not have been obvious to those of ordinary skill in the art at the time it was made. The Kampf Declaration is further objective evidence that supports this legal conclusion of non-obviousness.

In the case of *Panduit Corp. v. Dennison Manu. Co.*, 810 F.2d 1561 (Fed. Cir. 1987), the Federal Circuit clearly identified as one of "the four inquiries listed in *Graham:* . . . objective evidence (secondary considerations) . . . [which] may include: commercial success due to the invention; failure of others; long felt need; movement of the skilled in a different direction; skepticism of experts [citation omitted]; copying the invention in preference to the prior art [citation omitted]; and other events proved to have actually happened in the real world (hence the description "objective")." (Emphasis added.) The court footnoted Judge Rich's characterization of so-called secondary considerations as "Circumstantial evidence of the highest probative value." Rich, *Laying the Ghost of the "Invention" Requirement,* in Nonobviousness--The Ultimate Condition of Patentability 1:501, 513 (J. Witherspoon ed. 1978). In *Panduit*, the court stated:

> As above indicated, the district court's opinion indicates that it made two sets of findings . . . its reality-based first set (clear, fully supported findings on undisputed concrete objective real-world evidence of nonobviousness) . . . [and] . . . its speculation-based second set (nonprobative and clearly erroneous findings on prior art modified by Dennison and disputed by Panduit at trial). . . .
>
> We cannot see why the district court's first set of findings did not require a conclusion that Caveney's inventions, which had for years escaped others who sought them, "would not have been obvious" under § 103; nor why Panduit and Dennison wasted

> research resources for years if Caveney's inventions were obvious to all throughout those years; nor how the prior art made Caveney's eminently successful inventions obvious to the court in 1984 when it had not made them obvious to skilled engineers . . . who had been designing unsuccessful or far less successful cable ties for years when Caveney's inventions were made in the 1960's.

810 F.2d at 1577.

Not only has the Federal Circuit recognized that objective evidence of secondary considerations includes all facts underlying the real world story surrounding the invention, it has also consistently held that:

> [E]vidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538-40, 218 USPQ 871, 879 (Fed.Cir.1983).

The application of these principles to the present case is believed to be readily apparent. All of the evidence compels a reversal of the rejections of claims 1, 7, 9 and 11.

C. Claims 4-6 and 12-14

The rejection of claims 4-6 and 12-14 under Section 103(a) over "the prior art applied to claim 1" and further in view of Otsuka (U.S. 3,881,546) and Logsdon (U.S. 3,967,779)

Claims 4-6 and 12-14 relate to the preferred use of specially deflecting air control elements for the twofold purpose of (1) enabling compactness, i.e., keeping the mixing chambers small so that four can be put in the space normally occupied by two, and (2) overcoming the known problem of non-uniform temperature profiles in air streams exiting from heating/AC vents in the vehicle passenger compartment.

The rejection of claims 4-6 and 12-14 under Section 103 is believed to be improper for all of the reasons set forth above with regard to the basic combinations of references, as well as additional reasons regarding the further references relied upon in the rejection of these claims, i.e., the Otsuka and Logsdon references. At the outset, it should be noted that neither of these newly cited references in any way remedies the basic defects in the prior art teachings discussed above, as applied to claims 4-6 and 13-14, which all contain the feature that the claimed system is capable of independent control of both the temperature and the

volume of air supplied to each of the four zones.

It is telling that the PTO must rely upon the doctrine of inherency in connection with the Otsuka reference. There is absolutely no teaching whatsoever in Otsuka regarding the use of angled louvers to provide enhanced mixing of air, let alone in the context of an automotive heating/air-conditioning unit of the basic design recited in the present claims. In fact, Otsuka's fan 10 is downstream of the heater 8 and louver unit 9, and the specification states that "duct fan 10 is adapted to mix the heated and cooled air." (Col. 2, lines 30-31) Thus, first of all, the teaching in Otsuka is contrary to the premise for which it is cited. Second, the law is clear that "that which is inherent may not necessarily be known. Obviousness cannot be predicated on what is unknown." *In re Spormann*, 150 U.S.P.Q. 449, 452 (CCPA 1966). See also, *In re Rijckaert*, 9 F.3d 1531, 28 U.S. P.Q.2d 1955 (Fed. Cir. 1993) (retrospective view of inherency is not a substitute for some teaching in the prior art on which to base alleged obviousness). In fact, Appellants submit that inherency is the antithesis of "obviousness."

In addition, Appellants are not claiming to have invented a new principle of physics, but rather a novel and non-obvious application of many individually known structures and principles to a particular field of endeavor, namely, the production of a novel and clearly advantageous four-zone automotive heater/air-conditioner. The prior art simply does not teach any reason or advantage for employing the directed flaps and/or louvers in the manner claimed in claims 6 and 12-14, to produce the highly beneficial result of a four-zone heating/air-conditioning system that is capable of independently controlling the air volume and temperature in each zone. Indeed, JP '813 clearly did not recognize this advantage, i.e., in Figure 3 the louvers 23 appear to direct the warm air **away from** the cold air stream when opened part way!

Logsdon does not come from the automotive heating/air-conditioning field, but from the field of air handling generally. This reference too is evidence only of the fact that the principle of convergent air streams is known (since at least 1976) to provide more thorough mixing. The reference was selected in hindsight, not because there was any recognition that the application of this principle in an automotive heating/air-conditioning system would provide any particular advantage. In fact, the absence of any clear teaching in the automotive heating/AC prior art of applying this very old principle must be taken as objective evidence that its use was not appreciated by designers in this field.

Additional Unobvious Advantages/Features of Preferred Embodiments of Claims 4-6 and 12-14

Claims 4-6 and 12-14 are directed to another preferred aspect of the present invention, the use of louvers and flaps to accomplish a more thorough mixing action that has the added advantage of permitting a still even more compact and space-saving design of the system. While JP '813 discloses the use of louvers, as noted above, it is very evident from the drawings that no value was recognized in the orientation of those louvers. For example, in Fig. 3 of JP '813, the louvers are shown closing the lower half of the heater in a way that would, when partially open, tend to deflect the warm air in the direction opposite to the cold air. Apparently, the open position of the louvers is taught to be "straight ahead." Thus, the prior art recognizes neither the overall structure of claim 12 nor the advantages obtained by that structure.

In rejecting claim 12, the PTO requires at least four (4) prior art references in order to support the alleged "obviousness" of the claimed subject matter, with one reference being relied upon for its "inherent" disclosure, and another reference pulled from outside the automotive heating/AC art. This is all evidence of a rejection based on hindsight. Similar comments apply with regard to claim 6. Appellants submit, therefore, that claims 6 and 12 provide an independent basis for patentability and that the rejection is based on improper application of hindsight. Reversal of the rejection of claims 6 and 12 is requested for these reasons alone.

The PTO's attention is once again directed to the accompanying Rule 132 Declaration of Hans Kampf. In Paragraph 8 of his Declaration, Mr. Kampf sets forth the following relevant opinion and observations with respect to the subject matter of claims 12-14:

> It should be recognized that the design of a compact system that permits independent control of air temperature to four separate zones within a vehicle passenger compartment involves the reconciliation of two mutually contradictory considerations, namely, the trade-off between compactness and the ability to achieve thorough mixing (in a necessarily small mixing chamber) of warm and cold air, in order to overcome the problem of non-uniform temperature air streams, as discussed in the paragraph bridging pages 1 and 2 of the above-identified application. According to the preferred embodiment of the invention disclosed in this application and claimed in claims 12-14, not only can the mixing chambers be made more compact by using the louvered warm-air control elements, but with the claimed orientation of the louvers to direct warm-air toward the cold-air, it is possible to obtain an unexpectedly sufficient degree to mixing to overcome the problem of non-uniform air

> temperature streams exiting from the mixing chambers. Providing this advantage and overcoming the recognized problem in a way not previously taught in the automotive air-conditioning art should also be considered as objective evidence tending to show that the claimed invention would not have been obvious to a person of ordinary skill in the art at the time that the present invention was made. (Emphasis added)

The PTO must consider all evidence submitted in support of non-obviousness and therefore is required to consider the solution of yet another problem in the art (non-uniform temperature layers in the air streams exiting from passenger compartment vents) as part of the "invention as a whole" set forth in claim 12, when conducting its patentability evaluation under Section 103. The solution of this problem is strong objective evidence that the claimed invention was non-obvious at the time it was made.

It is not evident from the record that this further evidence of non-obviousness (already discussed in the specification at the bottom of page 2) has been properly considered by the PTO. Even after the Kampf Declaration was made of record following the Final Rejection, the Advisory Action is silent as to this additional issue and the related evidence contained in paragraph 8 of the Declaration. Appellants submit that the PTO has a strong burden to consider and address this evidence, and if the PTO cannot refute the presence of this advantage in the claimed invention, the PTO is obligated to acknowledge that this important improvement in performance is sufficient to support a conclusion that the invention is non-obvious. For these reasons, and due to the absence of any PTO refutation in the record, Appellants respectfully request that the rejection of claims 12-14 be reversed.

Claim 13 recites additional structure not shown in the references and recites the above-discussed independent control of the air volume in each of the four zones, i.e., the feature improperly ignored by the PTO. This claim is clearly allowable for all of the reasons set forth above in connection with claim 1.

Claim 14 adds to claim 13 additional structure (directed air flap at mouth of cold air duct) that is likewise not shown in any of the references, and not even in the "Modifications" constructed in the Final Office Action based on the combination of DE '359 and JP '813. This claim is therefore patentable for still additional reasons over and above claim 13. Similar comments apply with respect to claim 4.

Claim 5 depends from claim 4. The comments set forth above with respect to claims 14 and 4 also apply to claim 4. Additional beneficial effects are produced in Appellants' novel combination by virtue of the additional structure recited in claim 5, to aid in

establishing patentability to the overall combination.

With respect to claims 4-6 and 12-14, additional claimed structure leading to further meaningful advantages in the operation of the heating/AC system support the patentability of the claimed subject matter. The facts of record objectively demonstrate that neither the claimed combination of structural features nor the advantages resulting therefrom are taught or appreciated in the prior art. For these additional reasons, the rejections applied to these claims should be reversed.

IV. Conclusions

Appellants believe that the "invention as a whole" defined by the claims remaining in the application patentably distinguishes over the prior art and request reversal of the rejections raised in the final Office Action. The governing law of the Federal Circuit and the CCPA requires that the determination of obviousness before the PTO and in the courts be based on objective criteria, and in particular, that the patentability determination reflect the "real world" situation, i.e., looking at what persons of ordinary skill in the art did in the real world based on the state of the prior art as evidenced by the prior art of record. The objective evidence in this record, including the Declaration of Hans Kampf, who is a person of ordinary skill in the art, clearly demonstrates that the novel and very advantageous invention claimed herein was not recognized in this highly competitive field, although the basic teachings of the cited prior art were known for more than a decade before this invention and the advantageous characteristics resulting from this invention were recognized and unsuccessfully sought after equally as long prior to the present invention. In its broader aspects, the invention provides a system that is both very compact and of high functionality (i.e., countervailing demands), in that it provides independent control of both the temperature and volume of conditioned air supplied to four separate zones. In its preferred aspects, the invention claimed in claims 4-6 and 12-14 overcomes another problem in the art, namely, avoiding non-uniform temperature profiles in air streams exiting from outlet vents in the passenger compartment, again despite the compact design of the claimed system. This objective evidence represents hallmarks of a patentable invention.

It is believed that the PTO has fallen into the trap of believing that, just because the structural changes vis-à-vis the prior art are relatively uncomplicated, the invention must be

obvious. However, Section 103 does not focus on the differences *per se*, but rather requires an inquiry as to whether the "differences . . . are such that the subject matter as a whole would have been obvious." The "subject matter as a whole" includes all of the advantages of and the objective evidence surrounding the invention. In the present case, the claimed invention provides significant advantages in both design and operation, such that the only objective conclusion that can be reached is that the invention would not have been obvious at the time it was made.

Appellants submit that, in light of the evidence of record, the present application is in condition for allowance. Accordingly, Appellants respectfully solicit the Honorable Board of Patent Appeals and Interferences to reverse the rejections of the pending claims.

Respectfully submitted,

April 25, 2002
Date

Richard L. Schwaab
Reg. No. 25,479
Todd J. Burns
Reg. No. 38,011

FOLEY & LARDNER
3000 K Street, Suite 500
Washington, D.C. 20007-5109
(202) 672-5300
(202) 672-5399 (fax)

This Appeal Brief is being filed in triplicate together with a check in the amount of $320 (large entity) covering the appeal fee. If this fee is deemed to be insufficient, authorization is hereby given to charge any deficiency (or credit any balance) to the undersigned deposit account 19-0741.

Claims on Appeal

1. A heating or air-conditioning system for a motor vehicle, comprising:

a housing;

a heater that produces warm air situated within the housing;

two cold-air ducts formed in the housing, the cold-air ducts being routed laterally around both sides of the heater and each cold-air duct having an associated cold-air flap that controls air flow therethrough; and

partition walls within the housing, the partition walls forming four independent air-mixing chambers downstream of the heater in a direction of air flow, each individual mixing chamber including a warm-air control element that controls air flow therethrough and an air duct that feeds to an associated heating/air-conditioning zone, wherein the warm-air control element includes a plurality of moveable lamellae movable between an open position and a closed position to block heated air from the heater, one of the partition walls dividing each of the cold air ducts into two separate cold air ducts, to define four independent cold air ducts with each cold air duct communicating with one of the air mixing chambers and having said associated cold air flap therein,

whereby both the quantity and the temperature of air fed to each of the four associated heating/air-conditioning zones is independently controllable with respect to each other zone.

4. A heating or air-conditioning system as claimed in claim 1, wherein the cold-air flap is arranged at a mouth of the respective cold-air duct, and movable between an opened position and a closed position, the cold-air flap deflecting cold air toward warm air exiting the heater into the respective air-mixing chamber in its open position.

5. A heating or air-conditioning system as claimed in claim 4, wherein the cold-air flap is curved.

6. A heating or air-conditioning system as claimed in claim 1, wherein the lamellae of each warm-air control element in their open position deflect warm air laterally toward cold air entering the air-mixing chamber from the respective cold air duct.

7. A heating or air-conditioning system as claimed in claim 1, wherein the heater includes at

least a heat exchanger adapted to have drive unit coolant of a motor vehicle flowing through it.

9. A heating or air-conditioning system as claimed in claim 11, where the additional heater includes at least one electric heating element.

11. A heating or air-conditioning system as claimed in claim 7, wherein the heater further includes an additional heater arranged parallel to the heat exchanger.

12. A heating or air-conditioning system for a motor vehicle, comprising:

a housing;

a heater that produces warm air situated within the housing;

two cold-air ducts formed in the housing, the cold-air ducts being routed laterally around both sides of the heater and each cold-air duct having an associated cold-air flap that controls air flow therethrough; and

partition walls within the housing, the partition walls forming four air-mixing chambers downstream of the heater in a direction of air flow, each individual mixing chamber including a warm-air control element that controls air flow therethrough and an air duct that feeds to an associated heating/air-conditioning zone, wherein the warm-air control element includes a plurality of moveable lamellae movable between an open position and a closed position to block heated air from the heater,

wherein the lamellae of each warm-air control element in their open position are oriented to be partially open so as to deflect warm air laterally toward cold air entering the air-mixing chamber from the respective cold air duct.

13. A heating or air-conditioning system as claimed in claim 12, wherein
one of the partition walls divides each of the cold air ducts into two separate cold air ducts, to define four independent cold air ducts with each cold air duct communicating with one of the air mixing chambers and having said associated cold air flap therein,

whereby both the quantity and the temperature of air fed to each of the four associated heating/air-conditioning zones is independently controllable with respect to each other zone.

14. A heating or air-conditioning system as claimed in claim 13, wherein the cold-air flap is arranged at a mouth of the respective cold-air duct, and movable between an opened position and a closed position, the cold-air flap deflecting cold air toward warm air exiting the heater into the respective air-mixing chamber in its open position.